

SOCIAL MEDIA DATA FOR BIODIVERSITY RESEARCH



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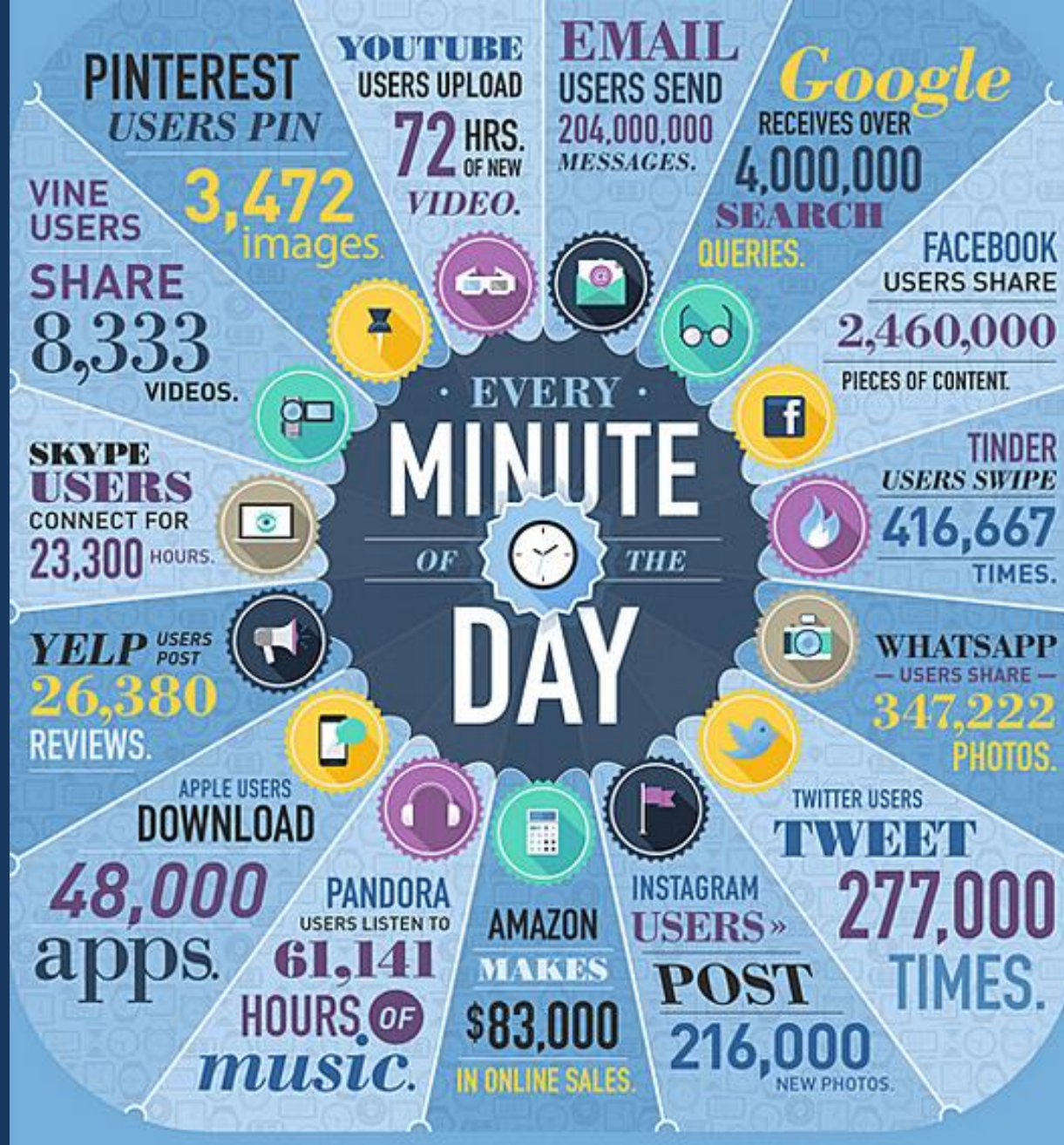
HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI



Tuulit

@TuuliToivonen

Geographer & tenure track professor of geoinformatics. Keen on novel (big/open) data sources and spatial analyses for urban, land use and conservation planning.



<http://www.internetlivestats.com/>



ELEMENTS OF A SOCIAL MEDIA POST



Photo: https://www.instagram.com/p/BH1qxN_Dm5q/?taken-by=htenkanen



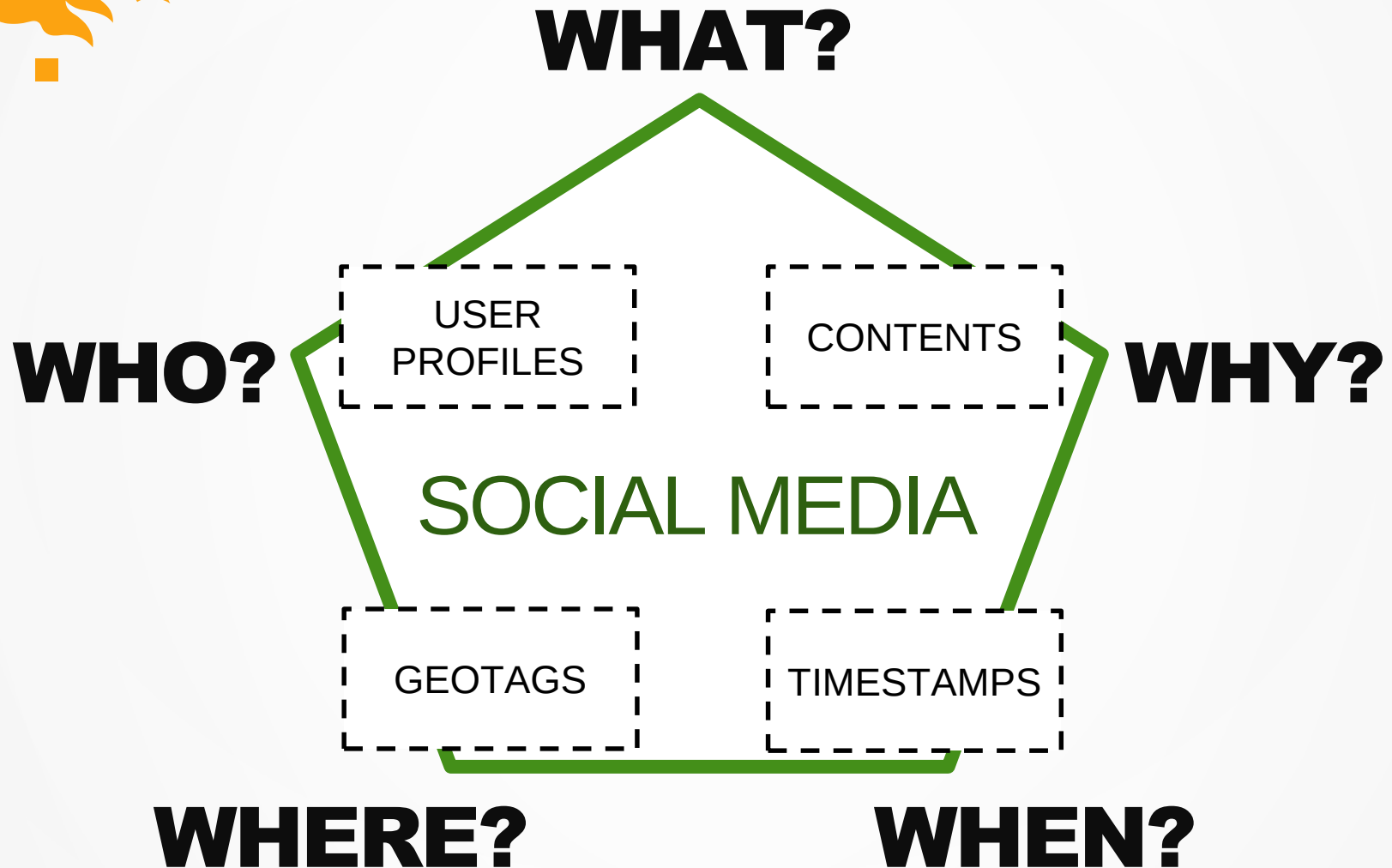
INFORMATION ON PEOPLE IN RELATION TO BIODIVERSITY?



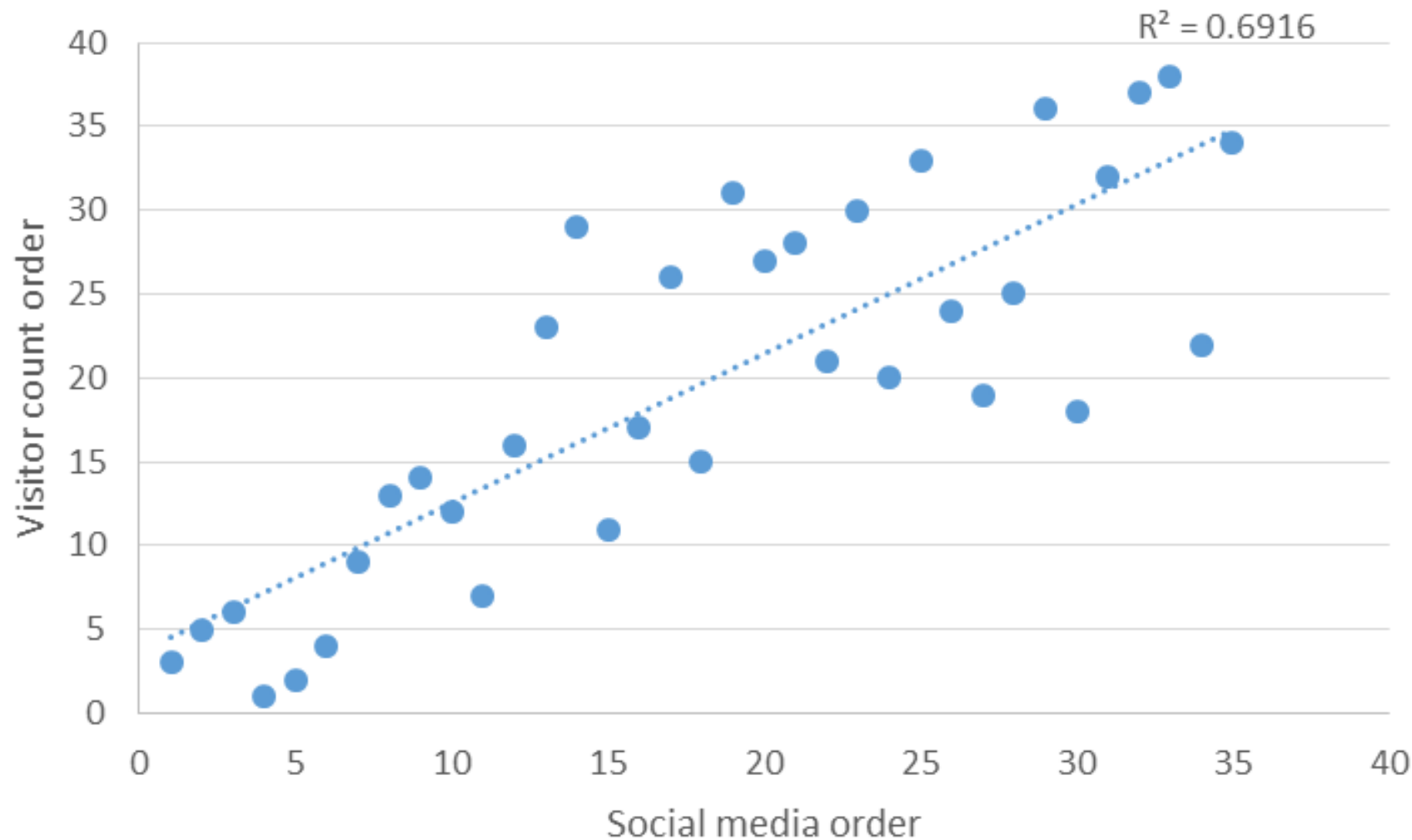
1. THREATS



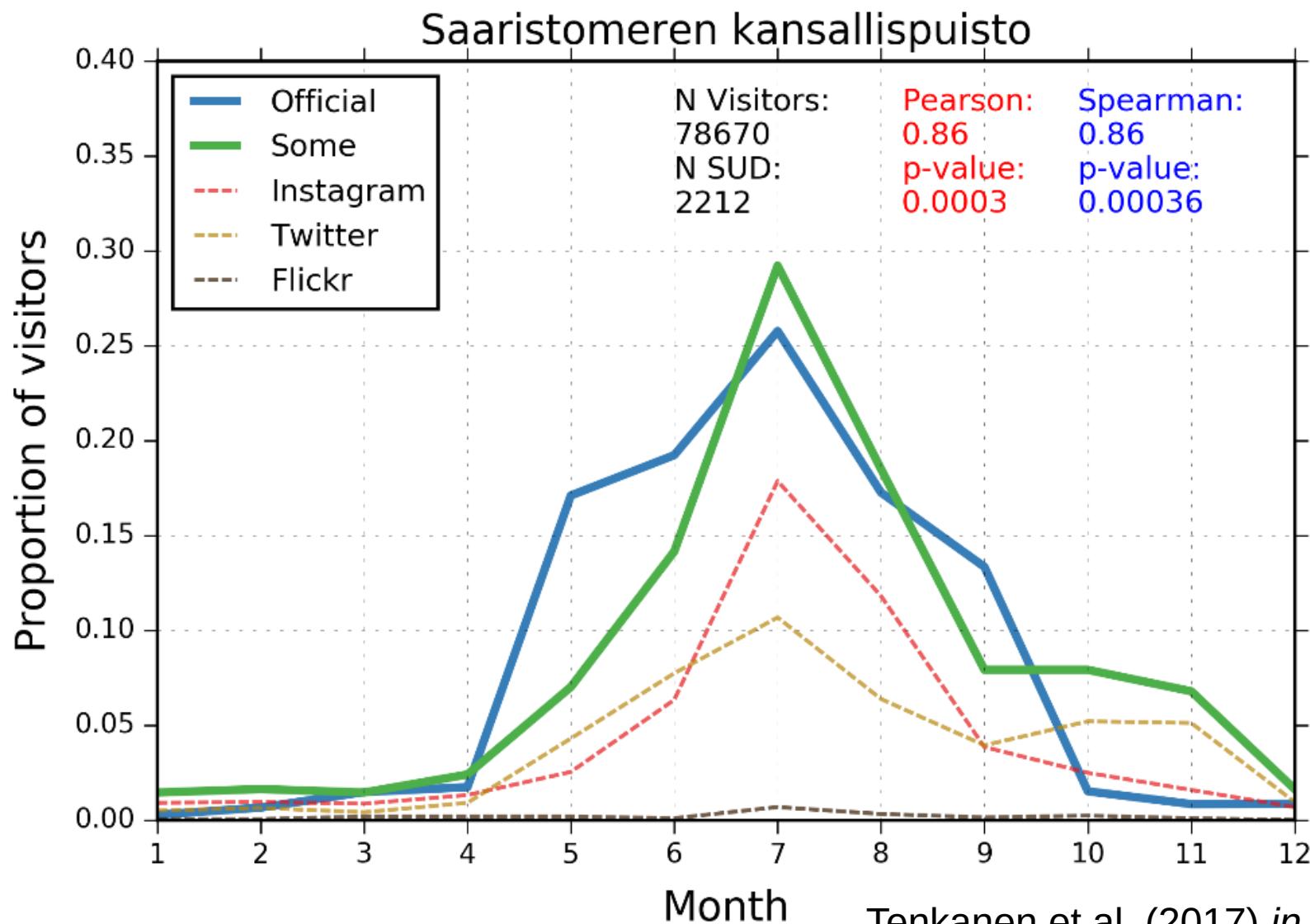
2. BENEFITS



FINNISH NATIONAL PARK VISITS VS. SOCIAL MEDIA USERS

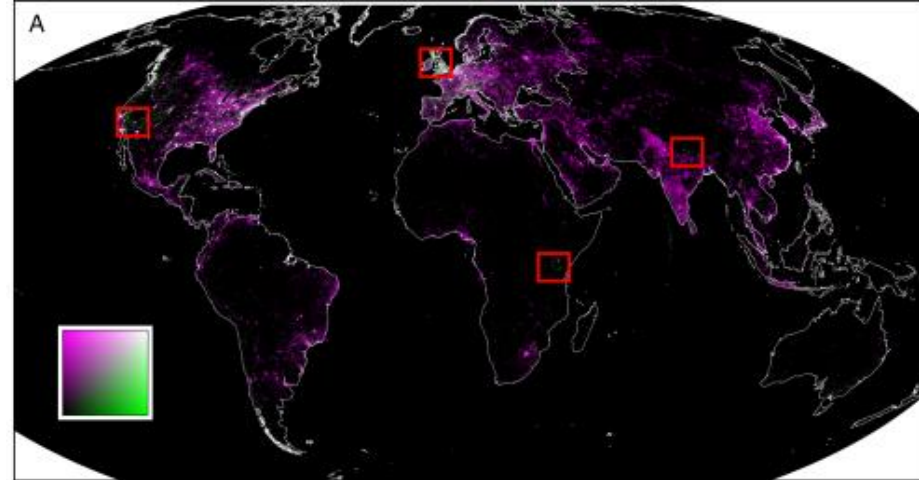


FINNISH NATIONAL PARK VISITS VS. SOCIAL MEDIA USERS

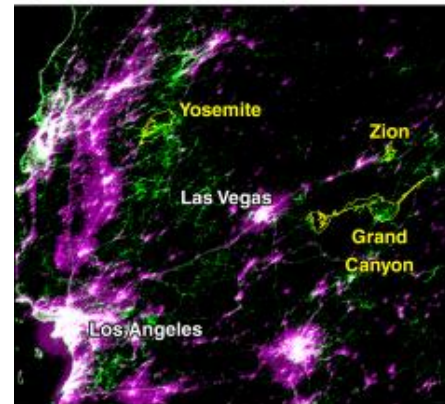


Tenkanen et al. (2017) *in review*

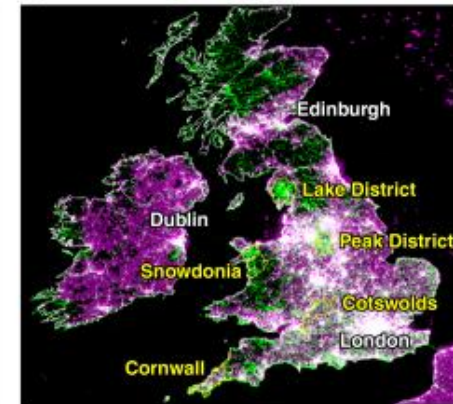
Levin et al. (2015) Where have all the people gone? Enhancing global conservation using night lights and social media.



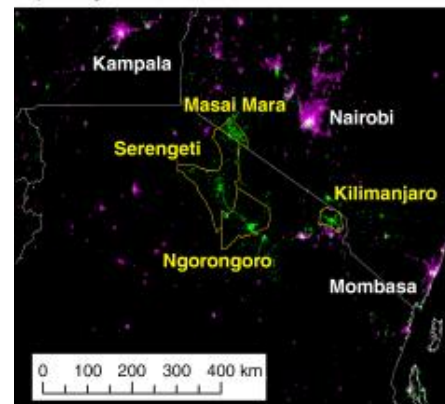
B) Southwestern United States



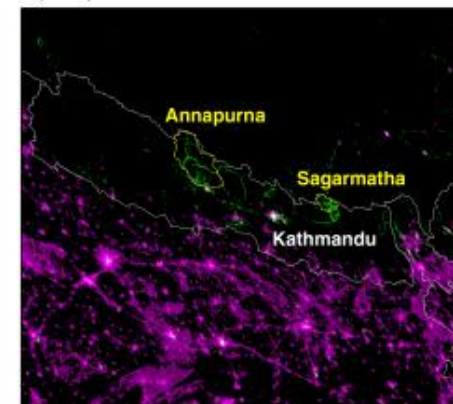
C) United Kingdom



D) Kenya and Tanzania

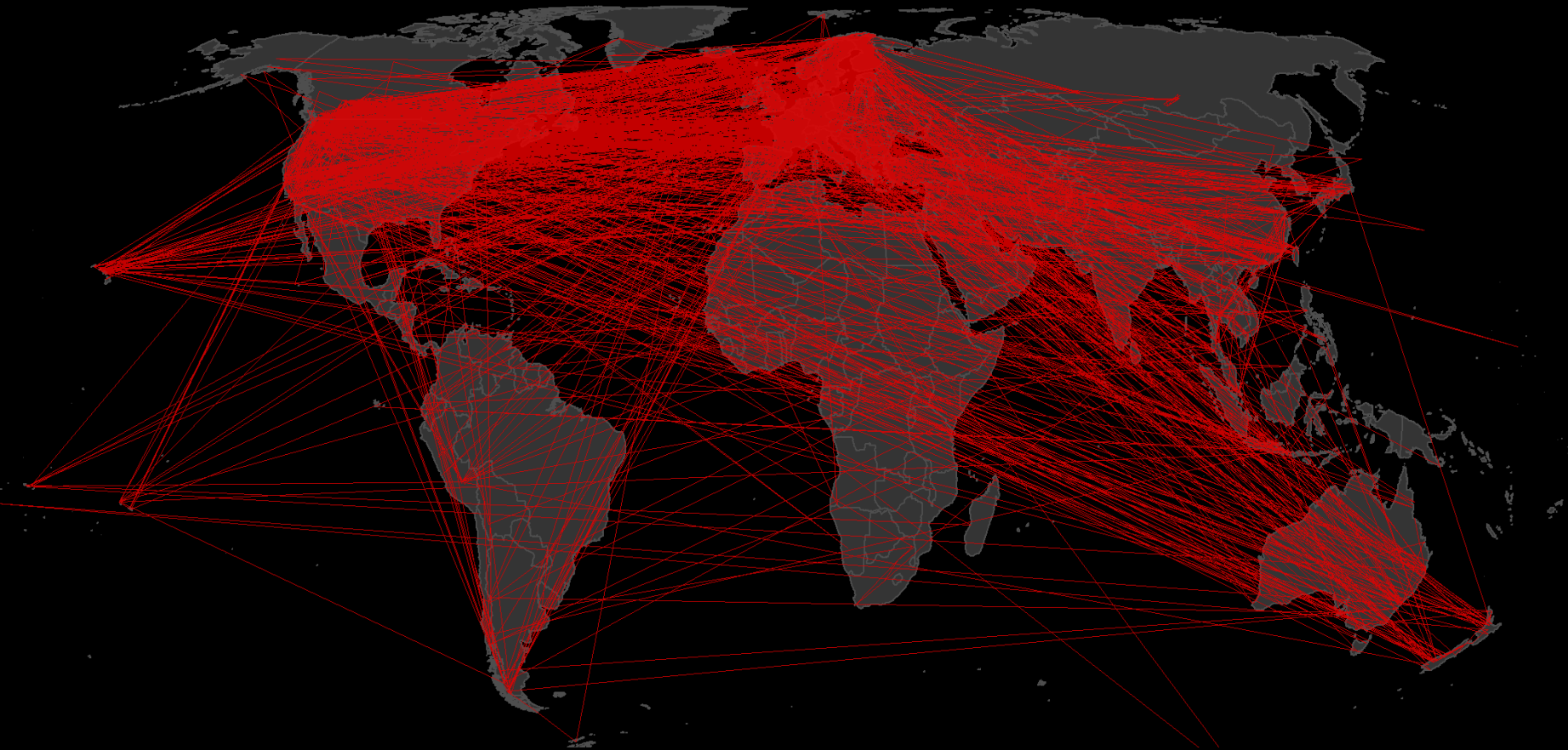


E) Nepal

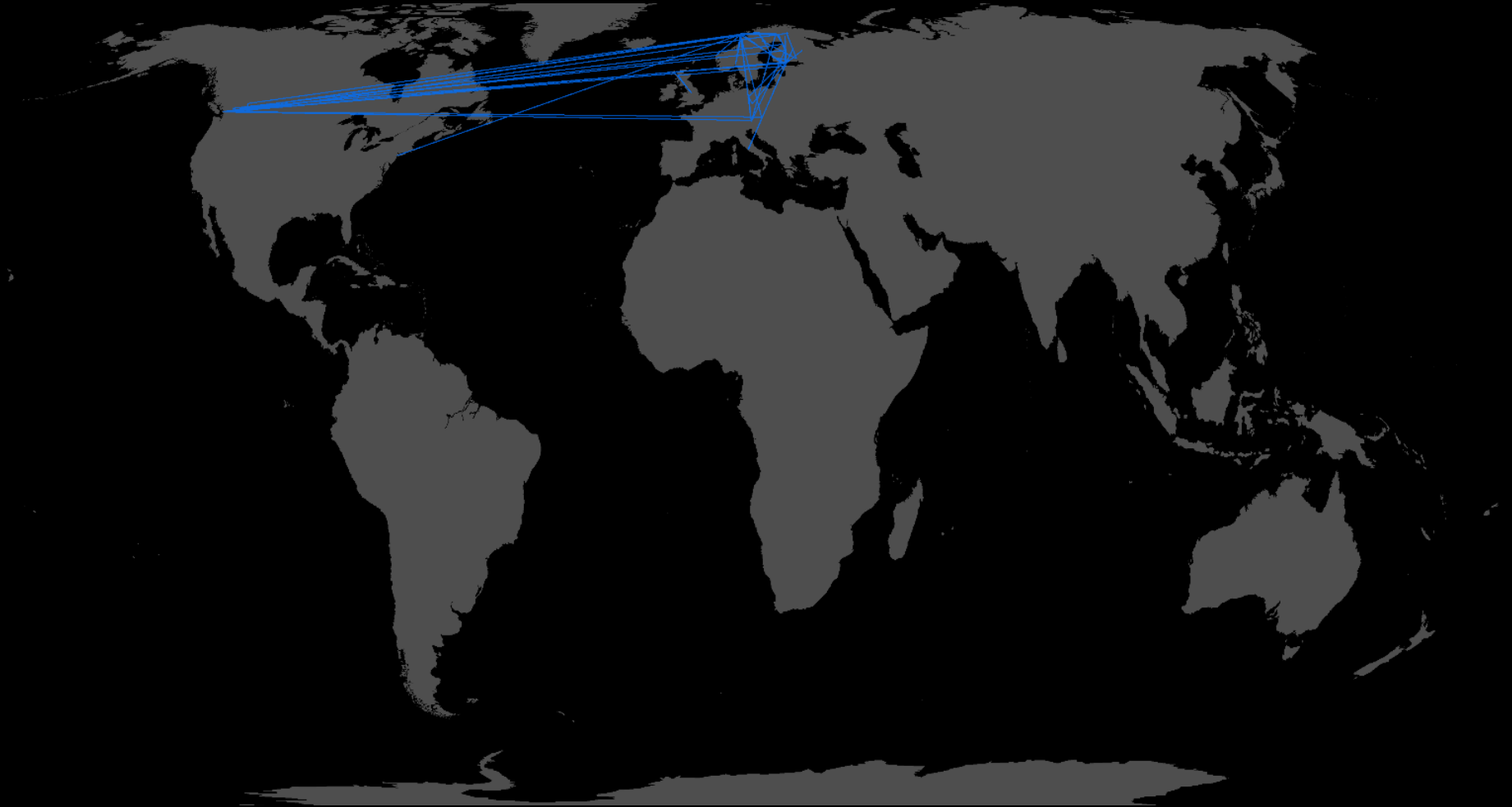


Ecological Applications
Volume 25, Issue 8, pages 2153-2167, 1 DEC 2015 DOI:
10.1890/15-0113.1
<http://onlinelibrary.wiley.com/doi/10.1890/15-0113.1/full#i1051-0761-25-8-2153-f04>

PALLAS-YLLÄS NATIONAL PARK

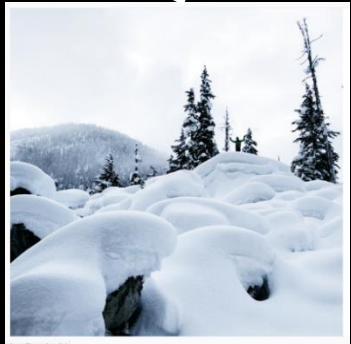
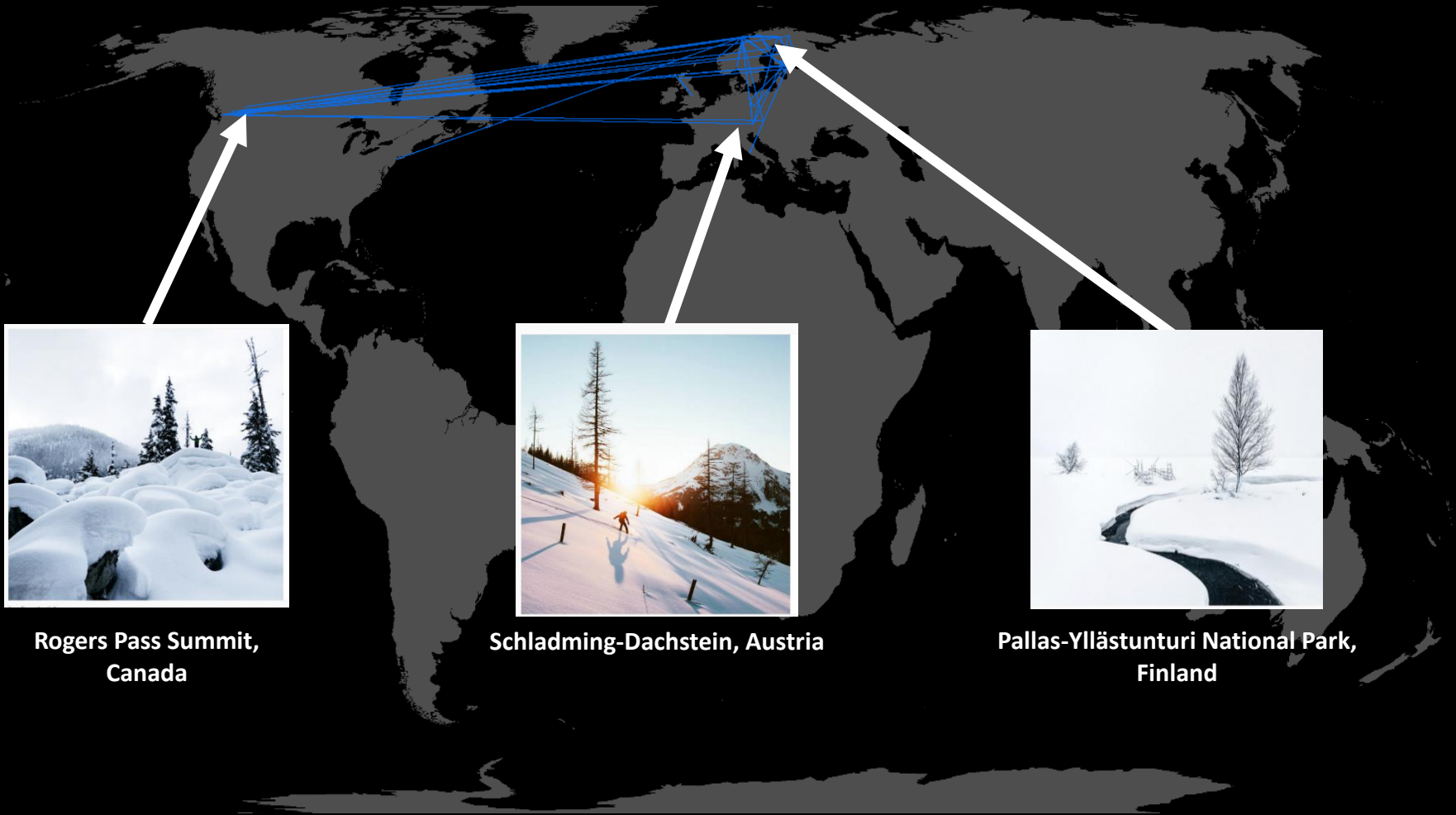


PALLAS-YLLÄS NATIONAL PARK

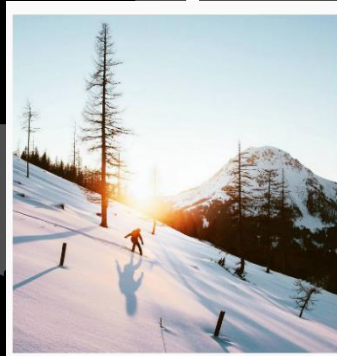


Posts from a Finnish Instagram-user. 107 posts in total.

PALLAS-YLLÄS NATIONAL PARK



Rogers Pass Summit,
Canada

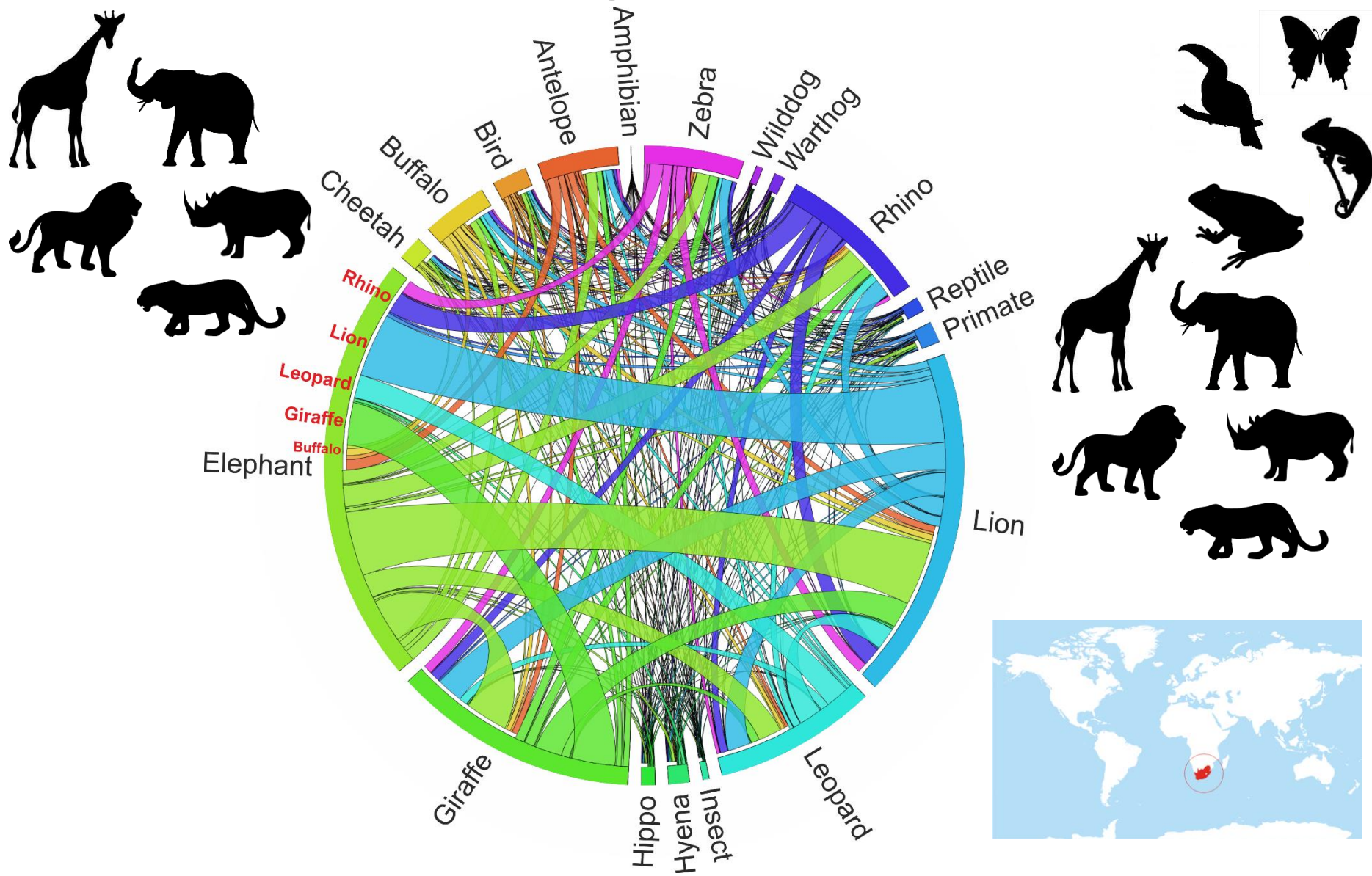


Schladming-Dachstein, Austria



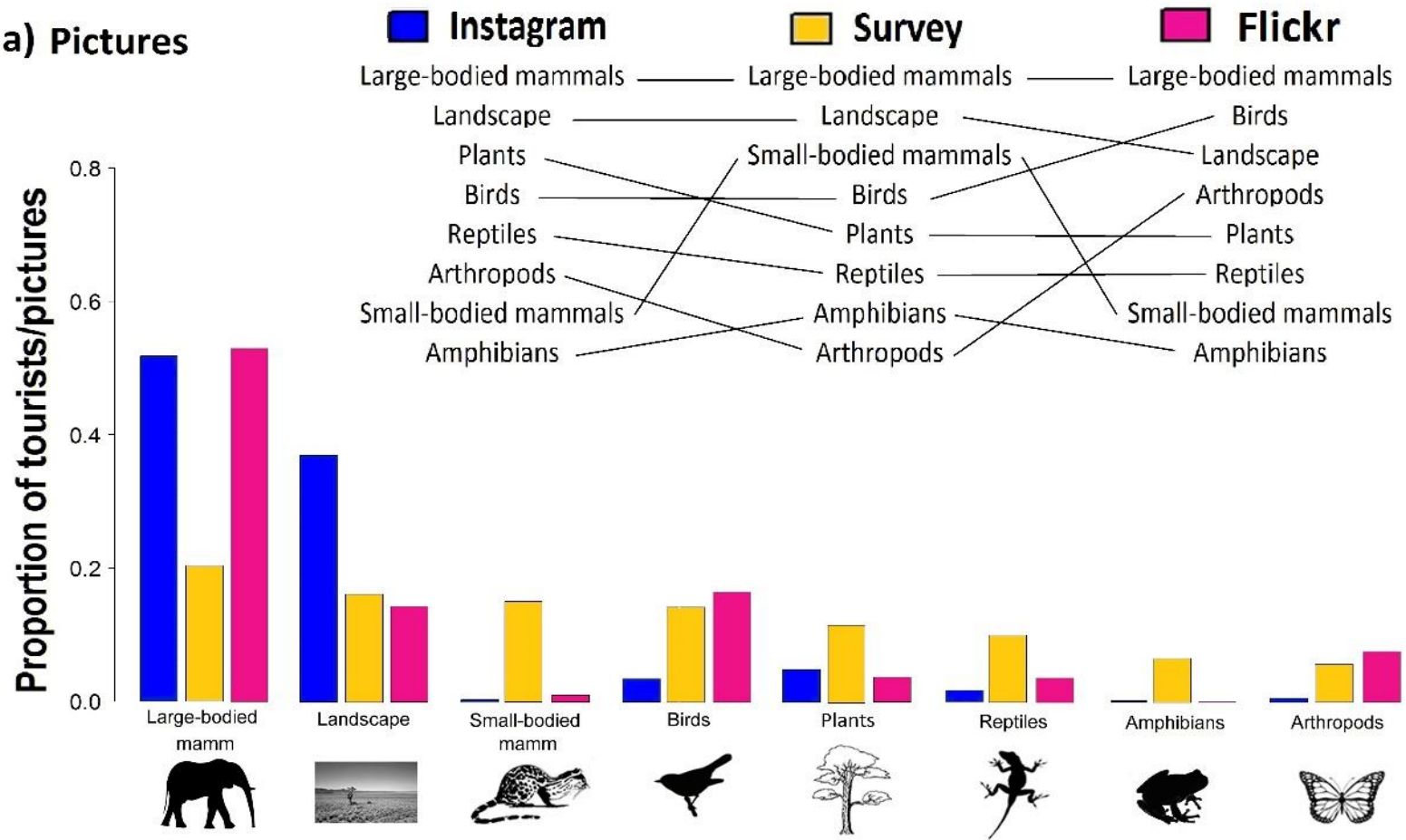
Pallas-Yllästunturi National Park,
Finland

INTERESTS REVEALED BY SOCIAL MEDIA POSTS, Kruger national park

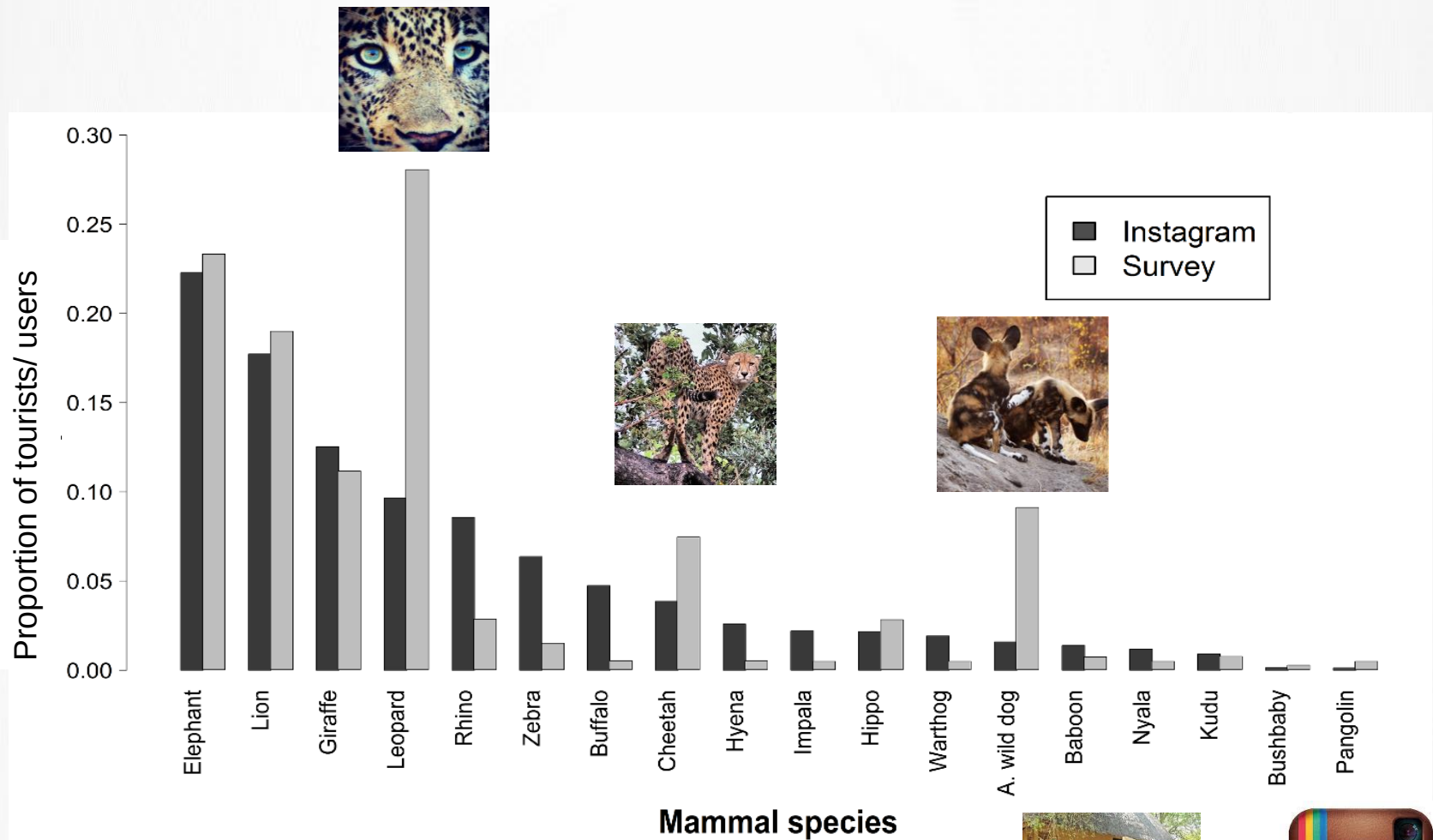


CAN WE DETECT BD PREFERENCES FROM POSTS? KRUGER NATIONAL PARK

a) Pictures



CAN WE DETECT BD PREFERENCES FROM POSTS? KRUGER NATIONAL PARK



Vs





DETECTING ACTIVITIES FROM POSTS (PALLAS-YLLÄS)

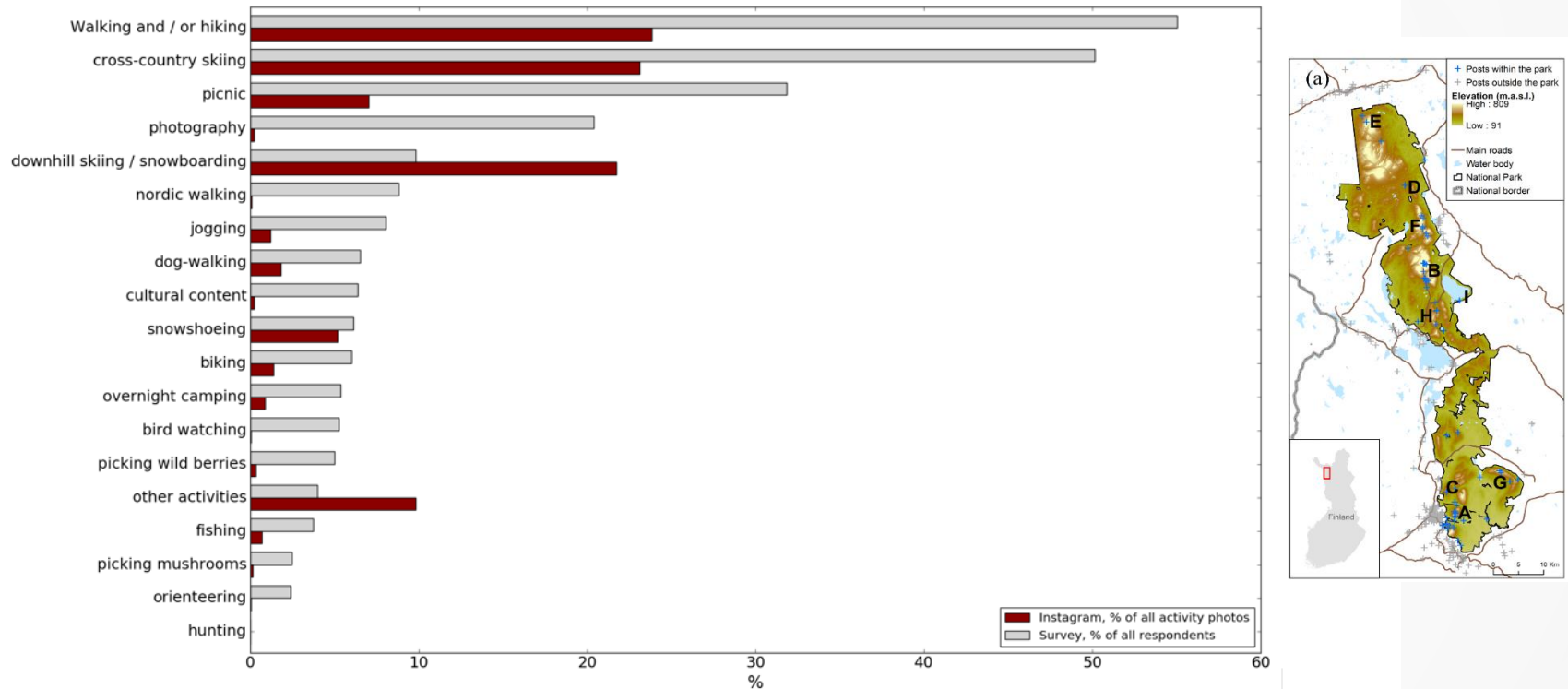
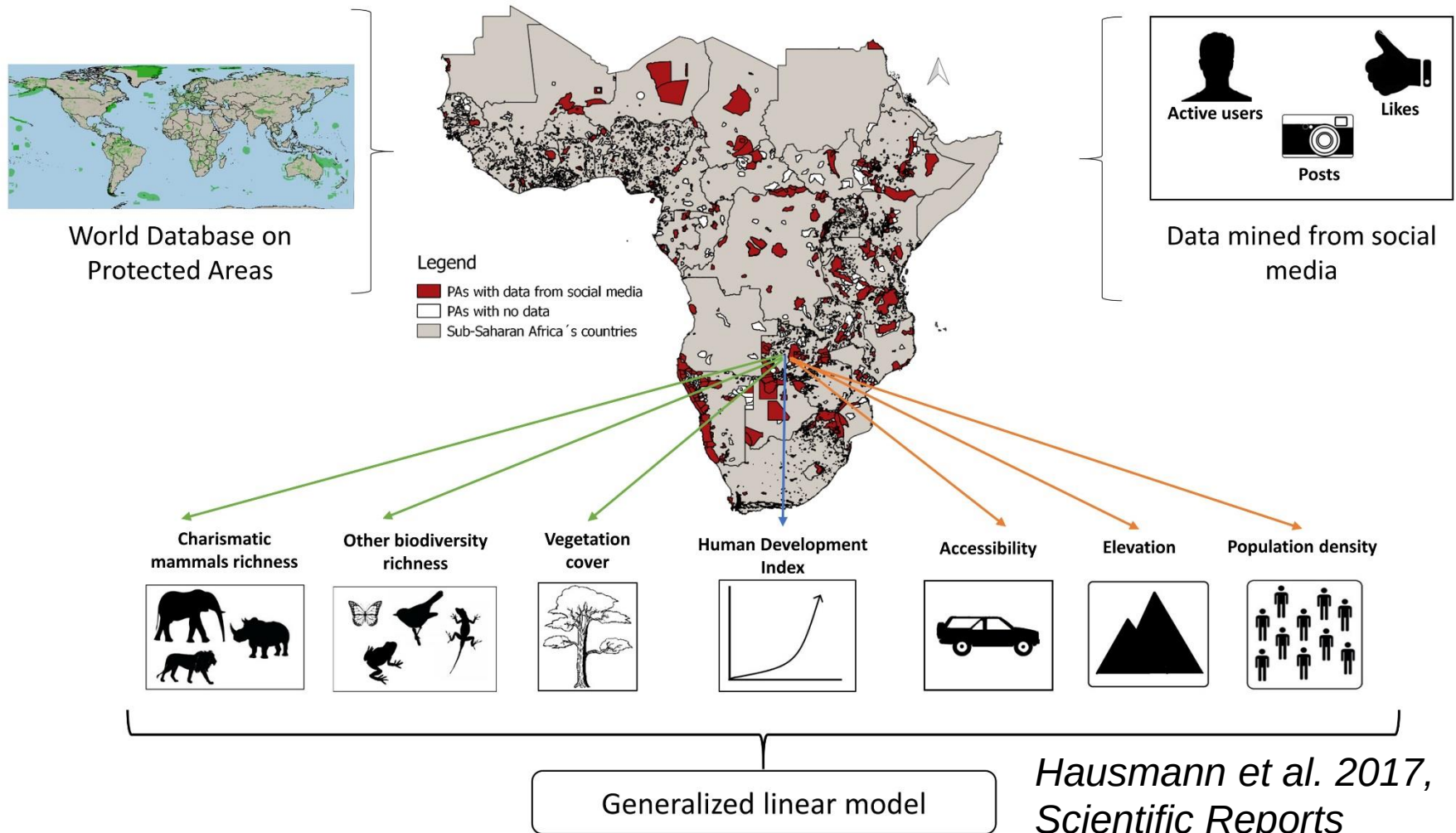


Figure 4. Proportion of respondents / Instagram photos per activity in PY National Park. Activities are sorted by popularity in the survey. *Heikinheimo et al. 2017, ISPRS International Journal of Geo-Information*

SOCIAL MEDIA REVEAL THAT CHARISMATIC SPECIES ARE NOT THE MAIN ATTRACTOR OF NATURE-BASED TOURISM TO SUB-SAHARAN PROTECTED AREAS





THREATS



BENEFITS

SOCIAL MEDIA DATA

WHAT?

WHO?

USER
PROFILES

CONTENTS

WHY?

**Human-BD
interaction**

GEOTAGS

TIMESTAMPS

WHERE?

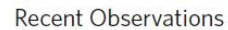
WHEN?

BIOSIVERSITY DATA



SOCIAL MEDIA CAN HELP TO ENGAGE PEOPLE FOR CROWDSOURCING EFFORTS

APPS FOR OBSERVATIONS



<https://www.semanticscholar.org/paper/The-iNaturalist-Challenge-2017-Dataset-Horn-Aodha/3dc522a6576c3475e4a166377cbbf4ba389c041f>

CROWDSOURCING SPECIES IDENTIFICATION



SNAPSHOT SERENGETI

[Home](#) [About](#) [Classify](#) [Profile](#) [Discuss](#) [Blog](#) [Authors](#)



☐ Fire ☐ No animals present

Looks like ▾

Pattern	Color	Horns	Tail	Build
Aardvark	Genet		Porcupine	
Aardwolf	Giraffe		Reedbuck	
Baboon	Guinea fowl		Reptiles	
Bat	Hare		Rhinoceros	
Bat-eared fox	Hartebeest		Rodents	
Bird (other)	Hippopotamus		Secretary bird	
Buffalo	Honey-badger		Serval	
Bushbuck	Hyena (spotted)		Steenbok	
Cattle	Hyena (striped)		Topi	
Caracal	Impala		Vervet monkey	
Cheetah	Insect/Spider		Vulture	
Civet	Jackal		Warthog	
Dik dik	Kori bustard		Waterbuck	
Duiker	Leopard		Wildcat	
Eland	Lion (female or cub)		Wildebeest	
Elephant	Lion (male)		Zebra	
Gazelle (Grant's)	Mongoose		Zorilla	
Gazelle (Thomson's)	Ostrich		Human	

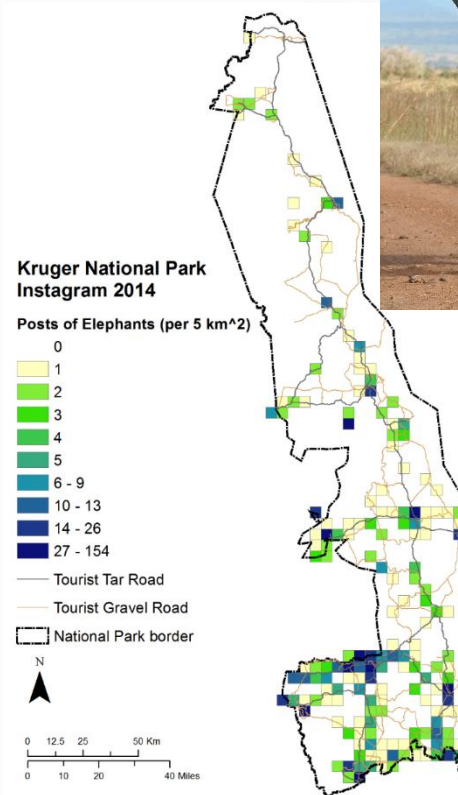
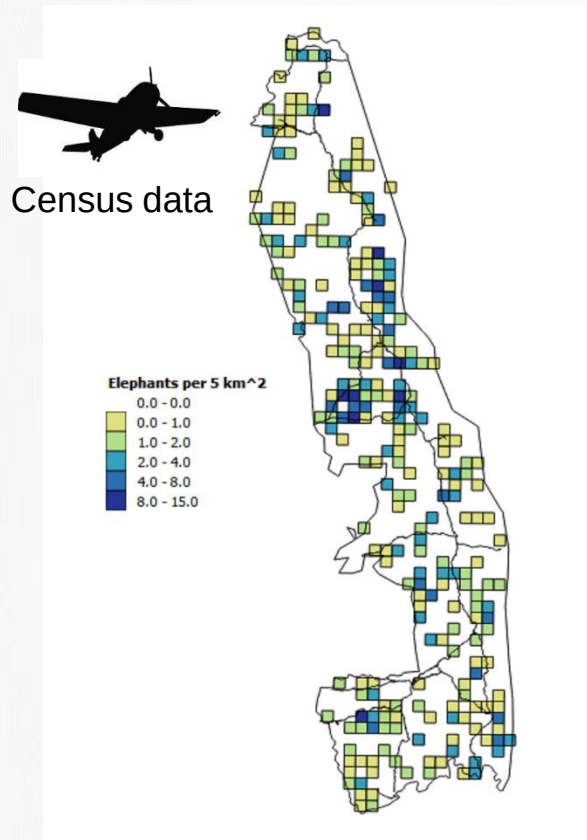
Swanson, A., Kosmala, M., Lintott, C., Simpson, R., Smith, A., & Packer, C. (2015). Snapshot Serengeti, high-frequency annotated camera trap images of 40 mammalian species in an African savanna. *Scientific Data*, 2, 150026. <https://doi.org/10.1038/sdata.2015.26>
<https://www.nature.com/articles/sdata201526>



COULD SOCIAL MEDIA PROVIDE BIODIVERSITY DATA?

DENSITIES OF ELEPHANT OBSERVATIONS IN KRUGER NATIONAL PARK, SOUTH AFRICA

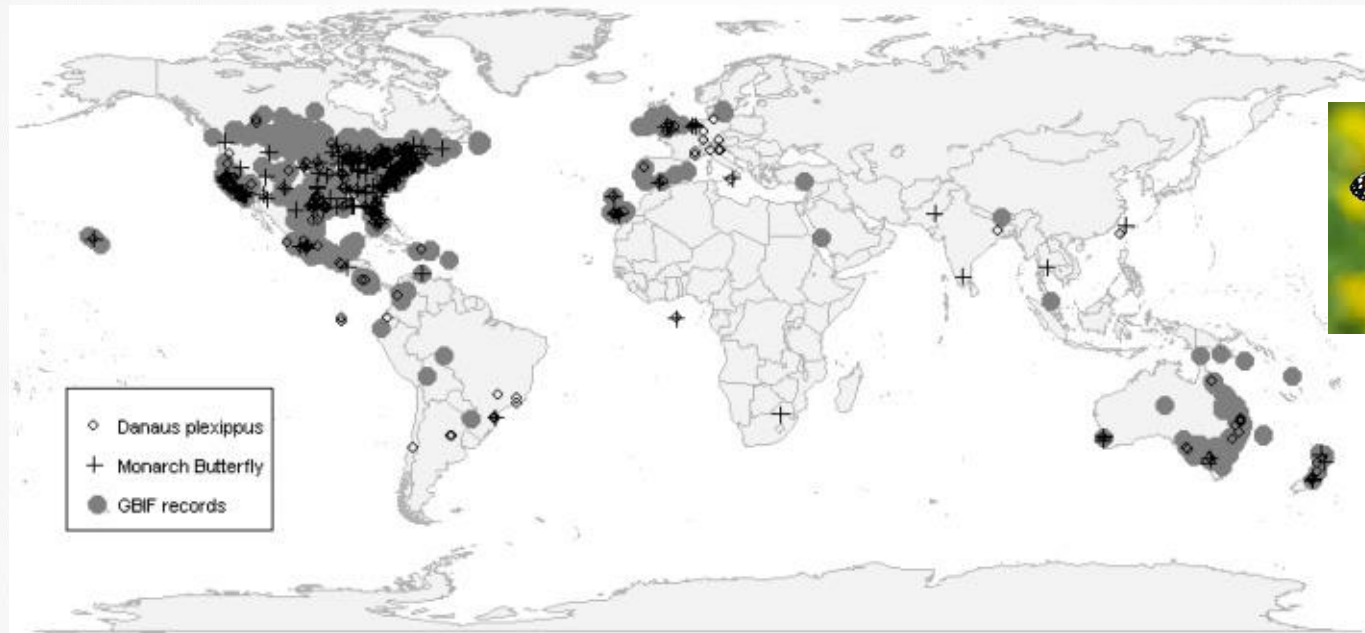
CENSUS DATA VS INSTAGRAM PHOTOS



SOCIAL MEDIA FOR SPECIES OCCURRENCES



Case example: Occurrence of the Monarch Butterfly (*Danaus plexippus*) according to Flickr and GBIF records



Barve, V. (2014). Discovering and developing primary biodiversity data from social networking sites: a novel approach. *Ecol. Inform.* 24, 194–199. doi: 10.1016/j.ecoinf.2014.08.008 <http://www.sciencedirect.com/science/article/pii/S1574954114001186#f0010>

Stafford R, Hart AG, Collins L, Kirkhope CL, Williams RL, et al. (2010) Eu-Social Science: The Role of Internet Social Networks in the Collection of Bee Biodiversity Data PLOS ONE 5(12): e14381. <https://doi.org/10.1371/journal.pone.0014381>

DIFFICULTIES IN DETECTING RELEVANT CONTENT

text	Donkeys in striped pajamas.
username	Max Joseph
userid	15036380
timestamp	2014-01-05T20:22:18
latitude	-24,216129
longitude	31,352838
likes	5926

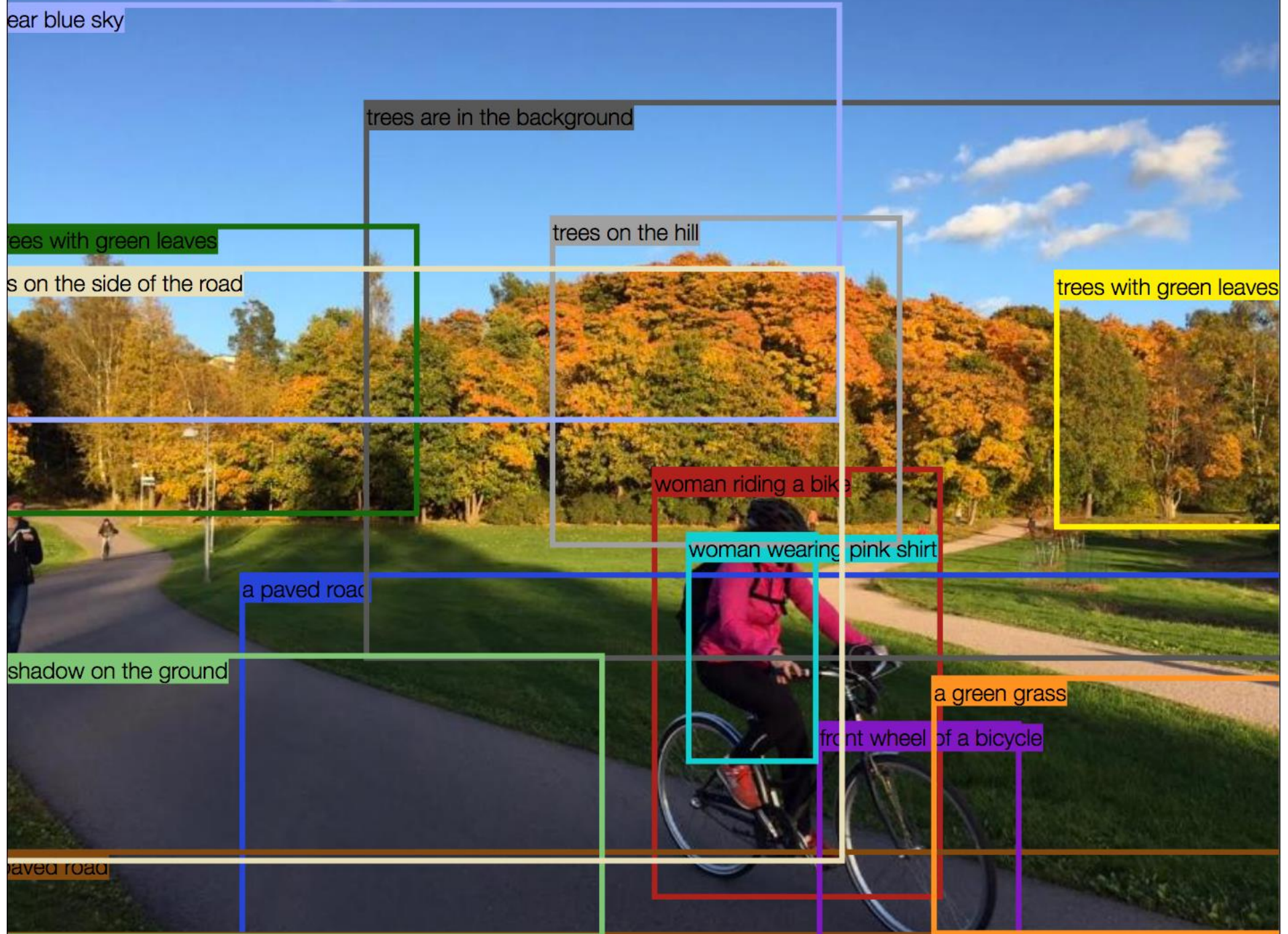




METHODS OF ARTIFICIAL INTELLIGENCE ARE DEVELOPING QUICKLY

AUTOMATIC ANALYSIS OF THE IMAGE CONTENT: WHAT?





AUTOMATIC ANALYSIS OF THE IMAGE CONTENT: WHO?



Sorry if we didn't quite get the age and gender right - [we are still improving this feature.](#)



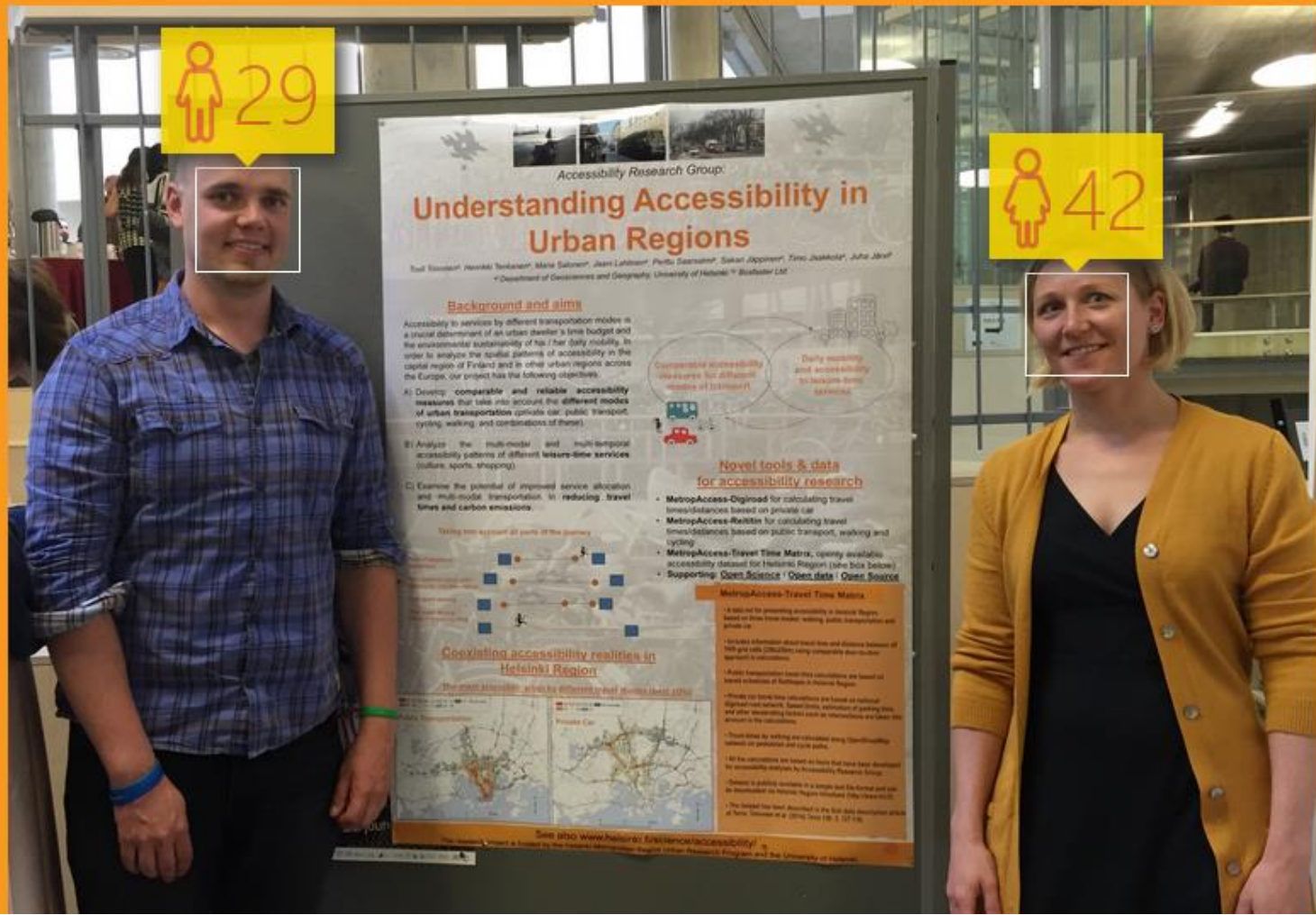
Try Another Photo!



How-Old.net

HOW OLD DO I LOOK? #HowOldRobot

See also: <https://www.projectoxford.ai/demo/face#detection>



DIGITAL GEOGRAPHY LAB



**Tuuli
Toivonen**



**Enrico
Di Minin**



**Olle
Järv**



**Henrikki
Tenkanen**



**Tuomo
Hiippala**



**Anna
Hausmann**



**Maria
Salonen**



**Vuokko
Heikinheimo**



**Gonzalo
Cortés Capano**



**Joel
Jalkanen**



**Johanna
Eklund**



**Elias
Willberg**

www.helsinki.fi/digital-geography



THANK YOU!

- SOCIAL MEDIA DATA FOR CONSERVATION SCIENCE 2016-2020
- INVESTIGATING ILLEGAL WILDLIFE TRADE 2016-2019

e-mail: tuuli.toivonen@helsinki.fi

www: www.helsinki.fi/digital-geography

